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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/756,183	01/13/2004	Alan D. Kersey	WEAT/0555	2079

36735 7590 02/09/2007  
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HOUSTON, TX 77056

EXAMINER
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BLEVINS, JERRY M

ART UNIT	PAPER NUMBER
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2883

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/09/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/756,183	KERSEY ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Jerry Martin Blevins	2883	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 November 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3,6,8,9,11-14,16,17,19 and 20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,6,8,9,11-14,16,17,19 and 20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date. _____   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Response to Arguments*

Applicant's arguments filed November 13, 2006 have been fully considered but they are not persuasive.

With regards to applicant's assertion that the previously applied prior art reference to Beasley, US 4,387,954, fails to teach that a property of the D-shaped portion changes in response to the measurand, examiner points out that in column 2, lines 8-15 and in column 4, lines 3-16, Beasley teaches that evanescent wave coupling property of the D-shaped portion changes in response to the measured pressure.

With regards to applicant's assertion that Beasley fails to teach that a refractive index of the layer changes in response to a change in the measurand, examiner points out that in column 2, lines 8-15 and in column 4, lines 3-16, Beasley teaches that the layer is compressed in response to a change in the measured pressure. Such a compression of the layer would invariably alter its refractive index.

In response to applicant's assertion that Beasley fails to teach strain applied to the D-shaped portion, examiner points out that in column 2, lines 8-15, Beasley teaches that pressure, or strain, is applied to the D-shaped portion. Although the D-shaped portion is not significantly compressed as the interleaved film is, Beasley clearly teaches strain applied to the D-shaped portion, which directly leads to the compression of the interleaved film. The strain of Beasley is not directly applied to the interleaved film but to the D-shaped portion.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Beasley.

Regarding claim 1, Beasley teaches an optical sensor for sensing a measurand (Figure 5 and column 2, lines 8-15, column 2, line 52 – column 4, line 16, column 4, lines 25-45), comprising: an optical waveguide (10A,10B) having an outer cladding (14A,14B) and at least one inner core (12A,12B) disposed therein which propagates light (column 2, line 52 – column 3, line 16, column 4, line 25-45); and a D-shaped portion of the optical waveguide having a generally D-shaped cross-section (10A,10B), wherein a property of the D-shaped portion changes in response to the measurand (column 2, lines 8-15, column 2, line 52 – column 4, line 16, column 4, lines 25-45); and a layer (24) disposed on a flat surface of the D-shaped portion, wherein a refractive index of the layer changes in response to a change in the measurand (column 3, lines 25-44).

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 3 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beasley in view of Hartman.

Regarding claim 3, Beasley teaches the limitations of the base claim 1. Beasley does not teach that the measurand includes at least one of the members of the group consisting of heat, humidity, light, electric field, magnetic field, and chemicals. Hartman teaches an optical sensor wherein a refractive index of a layer changes in response to at least one of the members of the group consisting of heat, humidity, light, electric field, magnetic field, and chemicals (column 14, lines 41-59). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the sensor of Beasley with the measurand of Hartman. The motivation would have been to expand the functionality of the sensor.

Regarding claim 8, Beasley teaches an optical sensor for sensing a measurand (Figure 5 and column 2, lines 8-15, column 2, line 52 – column 4, line 16, column 4, lines 33-45), comprising: a first D-shaped waveguide having a generally D-shaped cross-section (10A); a second D-shaped waveguide having a generally D-shaped cross-section (10B), wherein the first and second D-shaped waveguides are optically coupled together (column 3, line 24 – column 4, line 45) and wherein a property of at least one of the first and second D-shaped waveguides changes in response to the measurand (column 2, lines 8-15, column 2, line 52 – column 4, line 16, column 4, lines 25-45); and

a layer (24) disposed between the first and second D-shaped waveguides (Figure 5), the layer capable of changing thickness in response to the measurand (column 2, lines 8-15, column 4, lines 3-16). Beasley does not teach that the measurand includes at least one of the members of the group consisting of heat, humidity, light, electric field, magnetic field and chemicals. Hartman teaches an optical sensor wherein a refractive index of a layer changes in response to at least one of the members of the group consisting of heat, humidity, light, electric field, magnetic field, and chemicals (column 14, lines 41-59). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the sensor of Beasley with the measurand of Hartman. The motivation would have been to expand the functionality of the sensor.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beasley in view of U.S. Published Application to Bailey et al., 2002/0197037.

Regarding claim 6, Beasley teaches the limitations of the base claim 1. Beasley does not teach that a transverse outer dimension of the waveguide is greater than 0.3 millimeters. Bailey teaches an optical sensor and sensing method comprising a D-shaped optical waveguide (Figures 9-13, 15-17, 20-22, and 24), wherein a transverse outer dimension of the waveguide is greater than 0.3 millimeters (page 1, paragraph 5). It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the transverse outer dimension of greater than 0.3 millimeters, as taught by Bailey, in the waveguide of Beasley. The motivations would have been to improve packaging, reduce losses, and resist damage (Bailey, page 1, paragraph 7).

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beasley in view of Hartman as applied to claim 8 above, and further in view of U.S. Patent to Bergh, 4,386,822.

Regarding claim 9, Beasley in view of Hartman teaches the limitations of the base claim 8. Beasley also teaches that the first D-shaped waveguide has at least one first inner core (12A) disposed therein which propagates light (column 2, line 52 – column 3, line 16, column 4, line 25-45) and that second D-shaped waveguide has at least one second inner core (12B) which propagates light (column 2, line 52 – column 3, line 16, column 4, line 25-45). Beasley does not teach that the waveguides propagate light in substantially a few spatial modes. Bergh teaches an optical sensor comprising a D-shaped optical waveguide (Figure 2) wherein the waveguide propagates light in substantially a few spatial modes (column 1, lines 43-57). It would have been obvious to one of ordinary skill in the art at the time of the invention to propagate light through the waveguides of Beasley in substantially a few spatial modes, as taught by Bergh. The motivation would have been to increase the bandwidth of the propagating light.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beasley in view of Hartman as applied to claim 8 above, and further in view of Bailey.

Regarding claim 11, Beasley in view of Hartman teaches the limitations of the base claim 8. Beasley does not teach that the first and second D-shaped waveguides include a plurality of cores. Bailey teaches an optical sensor and sensing method comprising first and second D-shaped optical waveguides wherein the first and second

D-shaped waveguides include a plurality of cores (Figures 20-22). It would have been obvious to one of ordinary skill in the art at the time of the invention to include the multiple cores of Bailey in the waveguides of Beasley. The motivation would have been to increase the number of waveguiding paths (Bailey, page 1, paragraph 9).

Claims 12, 13, 16, and 19 rejected under 35 U.S.C. 103(a) as being unpatentable over Beasley in view of Rowe.

Regarding claim 12, Beasley teaches a method of detecting a parameter using an optical sensor (Figure 5 and column 2, lines 8-15, column 2, line 52 – column 4, line 16, column 4, lines 33-45), comprising: transmitting light through the optical sensor (column 2, line 52 – column 3, line 16, column 4, line 25-45); exposing a D-shaped portion (10A, 10B) of the optical sensor to the parameter (column 1, line 54 – column 2 line 7, column 2, line 52 – column 3, line 23, column 4, lines 33-40), wherein the D-shaped portion provides a change in one or more properties of the light transmitted through the optical sensor in response to the parameter (column 2, lines 8-15, column 4, lines 3-16); and detecting the one or more properties of the light transmitted through the optical sensor as a measure of the parameter (column 2, lines 8-15, column 2, line 52 – column 3, line 24, column 4, lines 3-16, 33-40). Beasley also teaches a strain applied to the sensor (column 2, lines 8-16, column 4, lines 3-16). Beasley does not teach that the strain applied to the sensor changes a polarization of the light. Rowe teaches that a strain applied to a sensor changes a polarization of light (abstract and column 2, lines 40-50). The motivation would have been to improve the sensing



capabilities of the parameter, since the change in polarization would be easily measurable and would be directly correlated to the change in the parameter.

Regarding claim 13, Beasley in view of Rowe teaches the limitations of the base claim 12. Beasley also teaches a layer (24) sensitive to the parameter (column 2, lines 8-15, column 4, lines 3-16) is disposed on a flat surface of the D-shaped portion.

Regarding claim 16, Beasley in view of Rowe teaches the limitations of the base claim 13. Beasley also teaches that the layer strains the D-shaped portion in response to a change in the parameter (column 2, lines 8-16, column 4, lines 3-16).

Regarding claim 19, Beasley in view of Bergh teaches the limitations of the base claim 13. Beasley also teaches that the D-shaped portion comprises a first D-shaped waveguide (10A) and a second D-shaped waveguide (10B) optically coupled together (column 3, line 24 – column 4, line 45) with a layer (24) disposed between the first and the second D-shaped waveguides (Figure 5).

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beasley in view of Rowe as applied to claim 13 above, and further in view of Hartman.

Regarding claim 14, Beasley in view of Rowe teaches the limitations of the base claim 13. Beasley does not teach that the parameter includes at least one of the members of the group consisting of heat, humidity, light, electric field, magnetic field and chemicals. Hartman teaches an optical sensor wherein a refractive index of a layer changes in response to at least one of the members of the group consisting of heat, humidity, light, electric field, magnetic field, and chemicals (column 14, lines 41-59). It

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would have been obvious to one of ordinary skill in the art at the time of the invention to modify the sensor of Beasley with the measurand of Hartman. The motivation would have been to expand the functionality of the sensor.

Claims 17 and 20 rejected under 35 U.S.C. 103(a) as being unpatentable over Beasley in view of Rowe as applied to claims 12 and 19, respectively, above, and further in view of Bailey.

Regarding claim 17, Beasley in view of Rowe teaches the limitations of the base claims 12. Beasley does not teach that a transverse outer dimension of the waveguide is greater than 0.3 millimeters. Bailey teaches an optical sensor and sensing method comprising a D-shaped optical waveguide (Figures 9-13, 15-17, 20-22, and 24), wherein a transverse outer dimension of the waveguide is greater than 0.3 millimeters (page 1, paragraph 5). It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the transverse outer dimension of greater than 0.3 millimeters, as taught by Bailey, in the waveguide of Beasley. The motivations would have been to improve packaging, reduce losses, and resist damage (Bailey, page 1, paragraph 7).

Regarding claim 20, Beasley in view of Rowe teaches the limitations of the base claim 19. Beasley does not teach that the first and second D-shaped waveguides include a plurality of cores. Bailey teaches an optical sensor and sensing method comprising first and second D-shaped optical waveguides wherein the first and second D-shaped waveguides include a plurality of cores (Figures 20-22). It would have been

obvious to one of ordinary skill in the art at the time of the invention to include the multiple cores of Bailey in the waveguides of Beasley. The motivation would have been to increase the number of waveguiding paths (Bailey, page 1, paragraph 9).

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jerry Martin Blevins whose telephone number is 571-272-8581. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JMB



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